What is Claimed Is:

1. An apparatus for conveying cargo, the apparatus comprising:

a stationary support for fixedly attaching to a vehicle structure;

a rotating support rotatably mounted to the stationary support;

a drive assembly movably mounted to the rotating support, the drive assembly comprising a roller and a first electronically controlled electric motor for rotating the roller;

a lift assembly comprising a second electronically controlled electric motor for moving the drive assembly relative to the rotating support from a retracted position substantially within the rotating support to an extended position with the roller in driving abutment against the cargo;

a rotation drive assembly comprising a third electronically controlled electric motor for rotating the rotating support relative to the stationary support; and

an electronic controller for controlling the first, second and third motors.

2. The apparatus of claim 1, further comprising:

a support base fixedly mounted to the rotating support;

wherein the drive assembly is pivotably mounted to the support base for limited vertical movement substantially normal to the longitudinal axis of the support base; and

wherein the lift assembly is for moving the drive assembly relative to the support base.

3. The apparatus of claim 1, wherein the first, second and third motors are permanent magnet brushless DC motors.

4. The apparatus of claim 1, wherein the third motor is fixedly mounted to the rotating support, the rotation drive assembly further comprising:

a pinion gear connected to rotate with an output shaft of the third motor, and

an internal spur sector gear fixedly mounted to the stationary support for meshing with the pinion gear for moving the rotating support relative to the stationary support when the pinion gear is rotated.

5. The apparatus of claim 4, further comprising a planetary reduction gear set connected between the output shaft of the third motor and the pinion gear.

6. The apparatus of claim 5, wherein the planetary gear set is a three stage gear set.

7. The apparatus of claim 4, wherein the pinion gear comprises a self-lubricating, high-strength plastic.

8. The apparatus of claim 7, wherein the pinion gear further comprises reinforcing glass, cloth or carbon fibers.

9. The apparatus of claim 4, wherein the spur sector gear comprises aluminum.

10. The apparatus of claim 1, further comprising a plurality of ball transfer units mounted on the rotating support for supporting the cargo and for preventing the cargo from contacting the roller when the drive assembly is in the retracted position.

11. The apparatus of claim 1, wherein the electronic controller comprises an electrical interface;

wherein the apparatus is controllable by an external controller via the electrical interface; and

wherein the electronic controller is for sending feedback signals to the external controller, the feedback signals including at least one of an identifier code for the apparatus, a cargo presence signal, a first motor speed signal, a third motor speed signal, a roller speed signal, a first motor load signal, a second motor load signal, and a thermal protection status signal.

12. The apparatus of claim 1, wherein the electronic controller comprises a non-volatile memory for storing operating information relating to the apparatus.

13. The apparatus of claim 12, wherein the operating information includes at least one of total operating time of the apparatus and total operating cycles.

14. The apparatus of claim 12, wherein the electronic controller comprises an electrical interface for downloading information from the non-volatile memory to an external computer.

15. The apparatus of claim 1, further comprising a rotation position sensor for detecting a radial reference position of the rotating support, and a commutation sensor in the third motor for determining a radial position of the rotating support relative to the reference position.

16. The apparatus of claim 15, comprising first and second rotation position sensors to detect 0 degree and 90 degree positions of the rotating support, wherein the commutation sensor determines an intermediate position of the rotating support between the first and second rotation position sensors.

17. The apparatus of claim 16, wherein the commutation sensor is for counting revolutions of the third motor.

18. The apparatus of claim 17, wherein the commutation sensor comprises a Hall-effect sensor.

19. The apparatus of claim 1, wherein the electronic controller is for controlling the third motor to rotate the rotating support when the drive assembly is in the retracted position.

20. The apparatus of claim 1, wherein the electronic controller is for locking the third motor to prevent rotation of the rotating support.

21. The apparatus of claim 1, comprising a sensor for detecting the presence of the cargo above the drive assembly and sending a cargo presence signal to the electronic controller.

22. The apparatus of claim 21, wherein the electronic controller is for operating the first and second motors only if it receives the cargo presence signal.

23. The apparatus of claim 1, comprising at least two sensors, each for detecting the presence of the cargo above the drive assembly and respectively sending a cargo presence signal to the electronic controller, wherein the electronic controller is for operating the first and second motors only if it receives the cargo presence signal from at least one of the sensors.

24. The apparatus of claim 22, comprising an input device for sending a manual override signal from a user to the electronic controller, wherein the electronic controller is for operating the motors when it receives the manual override signal and does not process the cargo presence signal.

25. The apparatus of claim 23, comprising an input device for sending a manual override signal from a user to the electronic controller, wherein the electronic controller is for operating the motors when it receives the manual override signal and does not receive the cargo presence signal.

26. The apparatus of claim 21, wherein the sensor comprises a non-contacting sensor.

27. The apparatus of claim 26, wherein the sensor comprises a Hall effect sensor, an infrared sensor, or an ultrasonic sensor.

28. The apparatus of claim 2, wherein the lift assembly comprises a cam rotatably mounted in the drive assembly and rotated by the second motor for reaction against a bearing in the support base to provide the vertical movement to the drive assembly;

wherein the drive roller is disposed between the second motor and the cam.

29. The apparatus of claim 28, wherein the bearing in the support base is supported by a pin disposed proximal to a corner of the support base.

30. The apparatus of claim 29, wherein the support base comprises aluminum.

31. The apparatus of claim 28, wherein the lift assembly further comprises a flexible tension cable connected to the second motor and the cam for transmitting torque from the second motor to the cam.

32. The apparatus of claim 31, wherein the flexible tension cable comprises a multi-strand steel cable.

33. The apparatus of claim 31, wherein the flexible tension cable comprises a composite cable or strap.

34. The apparatus of claim 1, wherein the electronic controller is for controlling the first motor to rotate the roller in a first direction or in a second direction opposite the first direction;

wherein when the lift assembly is in the extended position and the roller is rotating in the first direction, the electronic controller is for causing the first motor to rotate the roller in the second direction while maintaining the lift assembly in the extended position.

35. The apparatus of claim 21, wherein the electronic controller is for receiving a hold signal from an external controller; and

wherein the electronic controller is for causing the lift assembly to move from the retracted position to the extended position, and the first motor to hold the roller stationary, and the third motor to hold the rotating support stationary, when the electronic controller receives the hold signal and the cargo presence signal.

36. The apparatus of claim 1, comprising a circuit for measuring electrical current draw to the first motor, wherein the electronic controller is for monitoring the current draw of the first motor, and for removing power from the first motor when the current draw of the first motor exceeds a predetermined current draw for a predetermined time period.

37. The apparatus of claim 36, wherein the electronic controller comprises a memory for storing a power consumption curve representing a plurality of current draw values and corresponding time periods, and the electronic controller is for calculating the predetermined current draw and predetermined time period based on the power consumption curve.

38. The apparatus of claim 37, wherein the power consumption curve is for limiting the time of operation of the first motor to reduce scrubbing of the roller against the cargo.

39. The apparatus of claim 2, wherein the drive assembly comprises a continuous bore, and the first and second motors are mounted coaxially inside the bore.

40. The apparatus of claim 39, wherein the first and second motors each comprise a shaft and an inboard bearing for supporting the shaft; and

wherein the drive assembly further comprises an inboard bearing support for commonly supporting the inboard bearings of the first and second motors inside the bore.

41. The apparatus of claim 40, wherein the inboard bearing support comprises an axial spring for compensating for tolerance in the bore.

42. The apparatus of claim 40, further comprising primary drive gearing attached to the first motor shaft and lift gearing attached to the second motor shaft, wherein the bore is for housing the primary drive gearing and lift gearing.

43. The apparatus of claim 2, wherein the apparatus has a footprint defined by the length and width of the support base, and the roller has a footprint defined by the diameter

and length of the roller, wherein the footprint of the roller is greater than 20 percent of the footprint of the apparatus.

44. The apparatus of claim 43, wherein the footprint of the roller is about 23 percent of the footprint of the apparatus.

45. The apparatus of claim 1, wherein the electronic controller is for providing control, programmable by a user, of at least one of first motor traction force, second motor lift force, first, second and third motor speed, logic functions and electromagnetic interference control.

46. The apparatus of claim 1, comprising first, second and third motor temperature sensors, each for sending a respective motor temperature signal to the electronic controller.

47. The apparatus of claim 1, comprising:

an input/output port of the electronic controller; and

an interface cable for connecting to the input/output port and to one of a plurality of different external controllers for controlling the apparatus, the interface cable having circuitry for identifying the one external controller to the electronic controller;

wherein the electronic controller is for selecting and using software specific to the one external controller responsive to the cable circuitry.

48. The apparatus of claim 31, wherein the second motor is for moving the drive assembly from the extended position to the retracted position, and the lift assembly comprises a one-way clutch between the second motor and the flexible tension cable for allowing the second motor to free-wheel after the second motor moves the drive assembly from the extended position to the retracted position.